

Message

From: Qian, Yaorong [qian.yaorong@epa.gov]
Sent: 5/19/2021 6:45:59 PM
To: Nguyen, Thuy [Nguyen.Thuy@epa.gov]
Subject: RE: Quick question

Hi Thuy,

The FTIR is a quick and convenient way to qualitatively detect the presence certain compounds in gas, liquid, or solid samples. The principle FTIR is to shine a light and then detect the transmission or reflection of the light at a specific wavelength. It is possible to detect and differentiate C-F bond, such as that in PFAS, from other bonds, such as C-H, C=O, C-O, etc. with FTIR, provided that the presence of C-F bond and other bonds are in high abundance. FTIR can be used to check the fluorination level of a fluorinated HDPE container, because the C-H bond of the polymers on the surface are pretty much replaced by C-F bond.

Because this technology only measures the frequencies and intensities of chemical bond vibrations, it can only differentiate bond types in high abundance. PFAS in the fluorinated containers are only present in trace levels. The majority of the fluorinated compounds are in polymer forms. In addition, it cannot differentiate chemical species, such different PFAS compounds. If PFAS are present in high amount, the FTIR will see the C-F bond frequency but cannot tell if it is PFAS or other fluorinated compounds or fluorinated polymers.

In pesticide products, PFAS, if present, are only in trace amount. FTIR will not be able pick up the signal of the C-F bond vibration. Other material (all the inerts and active ingredients) will overwhelm the FTIR spectra. So FTIR will not tell us if there is PFAS in pesticide products.

Thanks,

Yaorong

From: Nguyen, Thuy <Nguyen.Thuy@epa.gov>
Sent: Wednesday, May 19, 2021 11:59 AM
To: Qian, Yaorong <qian.yaorong@epa.gov>
Subject: RE: Quick question

Don't forget this

Thanks

Thuy

From: Qian, Yaorong <qian.yaorong@epa.gov>
Sent: Tuesday, May 18, 2021 4:22 PM
To: Nguyen, Thuy <Nguyen.Thuy@epa.gov>
Subject: RE: Quick question

Completely forgot.

From: Nguyen, Thuy <Nguyen.Thuy@epa.gov>
Sent: Tuesday, May 18, 2021 4:02 PM
To: Qian, Yaorong <qian.yaorong@epa.gov>
Subject: FW: Quick question

I forgot that we owe Clive an answer on FTIR

From: Davies, Clive <Davies.Clive@epa.gov>
Sent: Tuesday, May 11, 2021 9:49 AM
To: Nguyen, Thuy <Nguyen.Thuy@epa.gov>
Subject: RE: Quick question

Thank you, Thuy.

Ex. 5 Deliberative Process (DP)

<https://www.agilent.com/en/product/molecular-spectroscopy/ftir-spectroscopy/ftir-compact-portable-systems/4300-handheld-ftir>

Ex. 5 Deliberative Process (DP)

Clive

Clive Davies, P.E.
Safer Choice Program
202-564-3821

From: Nguyen, Thuy <Nguyen.Thuy@epa.gov>
Sent: Tuesday, May 11, 2021 9:30 AM
To: Davies, Clive <Davies.Clive@epa.gov>; Butler, Tristan <Butler.Tristan@epa.gov>
Cc: Larkin, Jenna <larkin.jenna@epa.gov>; Williams, Bridget <Williams.Bridget@epa.gov>; Wen, Chen <Wen.Chen@epa.gov>
Subject: RE: Quick question

Hi Clive/Tristan

Just letting you know I have been reading your e-mails and I will get back with you on your proposal/approach soon. We are so swamped now at the lab

Thanks

Thuy

From: Davies, Clive <Davies.Clive@epa.gov>
Sent: Monday, May 10, 2021 11:37 AM
To: Butler, Tristan <Butler.Tristan@epa.gov>
Cc: Nguyen, Thuy <Nguyen.Thuy@epa.gov>; Larkin, Jenna <larkin.jenna@epa.gov>; Williams, Bridget <Williams.Bridget@epa.gov>; Wen, Chen <Wen.Chen@epa.gov>
Subject: RE: Quick question

Ex. 5 Deliberative Process (DP)

Clive

Clive Davies, P.E.

Safer Choice Program
202-564-3821

From: Butler, Tristan <Butler.Tristan@epa.gov>
Sent: Monday, May 10, 2021 11:34 AM
To: Davies, Clive <Davies.Clive@epa.gov>
Cc: Nguyen, Thuy <Nguyen.Thuy@epa.gov>; Larkin, Jenna <larkin.jenna@epa.gov>; Williams, Bridget <Williams.Bridget@epa.gov>; Wen, Chen <Wen.Chen@epa.gov>
Subject: RE: Quick question

Ex. 5 Deliberative Process (DP)

From: Davies, Clive <Davies.Clive@epa.gov>
Sent: Monday, May 10, 2021 11:27 AM
To: Butler, Tristan <Butler.Tristan@epa.gov>
Cc: Nguyen, Thuy <Nguyen.Thuy@epa.gov>; Larkin, Jenna <larkin.jenna@epa.gov>; Williams, Bridget <Williams.Bridget@epa.gov>; Wen, Chen <Wen.Chen@epa.gov>
Subject: RE: Quick question

Thanks so much, Tristan.

Another question in follow-up.

Ex. 5 Deliberative Process (DP)

Clive

Clive Davies, P.E.
Safer Choice Program
202-564-3821

From: Butler, Tristan <Butler.Tristan@epa.gov>
Sent: Monday, May 10, 2021 11:21 AM
To: Davies, Clive <Davies.Clive@epa.gov>
Cc: Nguyen, Thuy <Nguyen.Thuy@epa.gov>; Larkin, Jenna <larkin.jenna@epa.gov>; Williams, Bridget <Williams.Bridget@epa.gov>; Wen, Chen <Wen.Chen@epa.gov>
Subject: RE: Quick question

Good Morning Clive,

I know that there are portable FTIR spectrometers which could be used to detect C-F bonds in HDPE. Inhance Technologies uses FTIR to determine the level of fluorination in their products, but I am not sure if these portable devices have the same sensitivity as traditional desktop FTIR instruments. Here is a link to such a portable device.

<https://www.agilent.com/en/product/molecular-spectroscopy/ftir-spectroscopy/ftir-compact-portable-systems/4300-handheld-ftir>

From: Davies, Clive <Davies.Clive@epa.gov>

Sent: Monday, May 10, 2021 11:13 AM

To: Butler, Tristan <Butler.Tristan@epa.gov>

Cc: Nguyen, Thuy <Nguyen.Thuy@epa.gov>; Larkin, Jenna <larkin.jenna@epa.gov>; Williams, Bridget <Williams.Bridget@epa.gov>; Wen, Chen <Wen.Chen@epa.gov>

Subject: Quick question

Hi Tristan. I hope this is a quick and easy question.

Ex. 5 Deliberative Process (DP)

Thanks so much.

Clive

Clive Davies, P.E.
Safer Choice Program
Office of Pollution Prevention and Toxics
1200 Pennsylvania, NW (7406M)
Washington, DC 20460-0001

Deliveries:
EPA East Building
1201 Constitution Avenue, NW
Room 5419A (7406M)
Washington DC 20004-3302

202-564-3821 (phone)
202-506-0158 (mobile)

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For information on Safer Choice: epa.gov/saferchoice